



Cystic Ovarian Degeneration in Animals: An Overview

Abhay Kumar Meena*, Chandra Shekher Sarswat¹, Sumit Prakash Yadav² and Sulochana dariya³

*M.V.Sc Scholar, Department of Veterinary Gynaecology and Obstetrics, Post Graduate Institute of Veterinary Education and Research (PGIVER), Jaipur. Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner, Rajasthan, India.

¹ Assistant Professor, Department of Veterinary Gynaecology and Obstetrics, Post Graduate Institute of Veterinary Education and Research (PGIVER), Jaipur. Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner, Rajasthan, India.

² Assistant Professor, Department of Veterinary Gynaecology and Obstetrics, Post Graduate Institute of Veterinary Education and Research (PGIVER), Jaipur Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner, Rajasthan, India.

³ Veterinary officer, Veterinary Hospital Nandwara Masuda Ajmer, Animal Husbandry Department Rajasthan.

<https://doi.org/10.5281/zenodo.7404796>

Abstract

Cystic ovarian disease is a major cause of reduced reproductive efficiency and economic loss to the dairy industry. Postpartum illness and stress reduction should be the main goals of cystic ovarian disease prevention strategies. The capacity to diagnose cystic ovarian degeneration has been substantially enhanced by ultrasound. Different regimens combining GnRH and PGF2 have shown to be more effective than those that employ GnRH alone. Our ability to prevent, detect, and treat COD will continue to improve as more of the disease's complicated pathophysiology is understood.

Key Words: Cystic ovarian disease, follicular cysts, luteal cysts, ultrasonography.

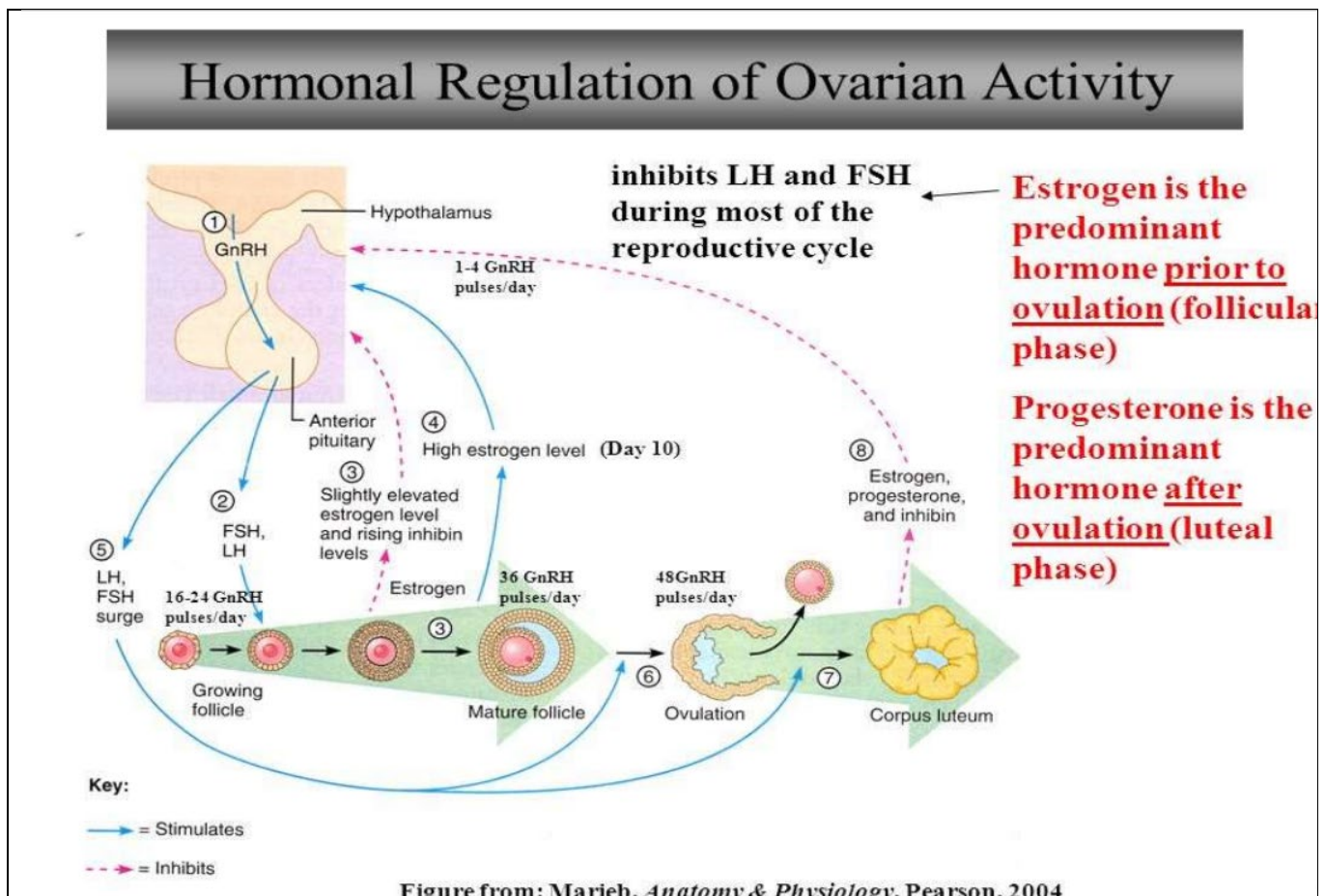
Introduction

Cystic ovarian degeneration is characterized by one or more large anovulatory follicles, greater than 2.5 cm in diameter, present in one or both ovaries that persist for at least 10 days in the absence of a corpus luteum with abnormal oestrus behaviour (Youngquist and Threlfall, 2007). One or more large follicles greater than 17mm in diameter, fail to ovulate and subsequently do not regress and persist for at least 10 days, but maintain growth and steroidogenesis (Vanholder et al., 2006). The condition has been referred to by many names over the past century including adrenal virilism, nymphomania, cystic ovarian degeneration, cystic ovaries, and ovarian cysts (Garverick, 1997).

COD remains an important cause of the extension of the interval from calving to conception and increased number of inseminations per conception thus decreased the reproductive performance. The disease is a common condition of dairy cattle characterized by ovulatory failure. Their incidence ranged

from 5% to 8%. COD is more common in the early post-partum period (less than 60 days) at which cows are under great metabolic stress. Cystic ovarian disease is an important form of functional infertility in buffaloes, particularly in high producing river buffaloes than in the suckled swamp buffalo. In a survey, cystic ovaries accounted for 6 % of reproductive failure in over 12000 river buffaloes in India and most cases occurred before day 45 post-partum (Rao and Sreemannarayanan, 1982).

Many factors have been associated with COD although their exact mechanism of action is not known. These factors include, high milk production, a sever negative energy balance and ketosis, twinning and peri parturient problems genetic predisposition, season, and nutritional disorders suggested that, COD results from the failure of the pituitary gland to release sufficient amounts of LH to induce ovulation. However, many studies of the endocrine profiles of cows with COD, showed that, concentrations of serum LH are high or normal serum FSH are low or normal, and serum inhibin are high. In addition to the alteration in gonadotropin levels, there is a deficiency in LH and FSH receptors at the ovarian level.



Subnormal luteal levels of progesterone in high-producing dairy cows, especially energy compromised



Inadequate formation of LH receptors





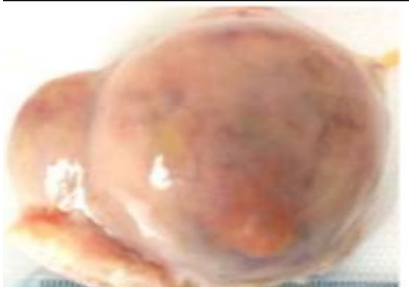
Decreased sensitivity to LH of the growing follicle



Creation of a persistent dominant follicle and cyst arrest of the next follicular waves before dominance and ovulation

Anovulation and anestrus

Classification of cystic ovaries

Follicular Cyst	Luteal Cyst	Cystic Corpora Lutea
<p>One or more than one thin walled an ovulatory follicle and greater than 2.5 cm in diameter with fluid filled cavity.</p> <ul style="list-style-type: none"> • Persists for 10 or more days in the absence of a functional CL • Accompanied by either nymphomania or frequent estrus 	<p>Thick walled, partially luteinized an ovulatory follicle, more than 2.5 cm in diameter</p> <ul style="list-style-type: none"> • Persists for a prolonged period • Characterized by anoestrus 	<p>Non-pathological CL containing greater than 7 mm fluid filled central cavity with distinct ovulation papilla.</p> <ul style="list-style-type: none"> • Produces sufficient concentration of progesterone (7-8ng/ml) to maintain pregnancy • 100 mcg of P4- Supports pregnancy • Often slightly fluctuating soft consistency
		

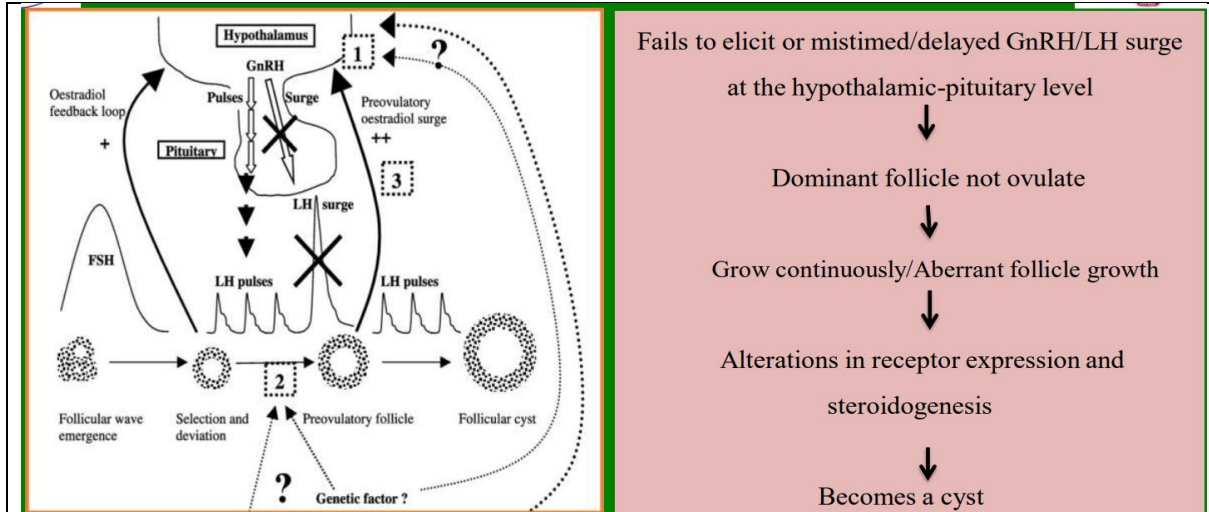
Mechanism of cyst formation

- ✓ In spite of many research, the exact mechanism of COD is unclear.
- ✓ Generally accepted mechanism is disruption of Hypo thalamo- Pituitary-Gonadal axis.

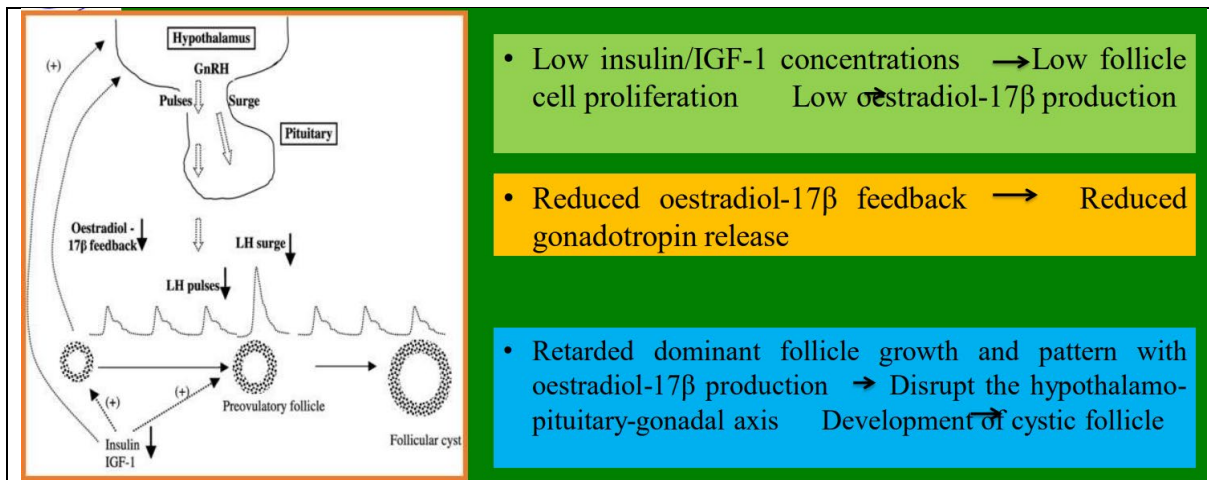


A. Intrinsic factors B. Extrinsic factors

A. Intrinsic factors



B. Extrinsic factors



Signs and symptoms

Follicular cyst

- Frequent, irregular, prolonged or continuous signs of estrus.
- Often nervous, restless and bellow frequently.
- Frequently attempt to ride other cows but refuse to stand to be ridden.
- Aggravated homosexual characteristics (Bullers).
- Uterus and cervix – large, dematous and flaccid
- Cervical canal- dilated and relaxed, permitting a finger or pencil to pass through.
- Endometrium - smooth, moist, semi-transparent and oedematous.
- Vagina, clitoris and vulva – swollen

Sterility hump:

- Excess relaxation of the pelvic ligament leads to tipping of pelvis and elevation of tail head.
- In long standing cases of Nymphomania, tipping of pelvis is very common.
- Ligaments fail to regain their tone even after recovery and conception.
- Tipping of the pelvis may result in an unsteady gait and predispose to injuries.





Sterility hump

Adrenal virilism:

- Commonly observed in chronic follicular cyst cases
- Exhibit a muscular behaviour and appearance
- Increased level of 17β Keto Steroids in urine from the adrenal gland
- Masculinization of head and neck (Steer-like appearance)

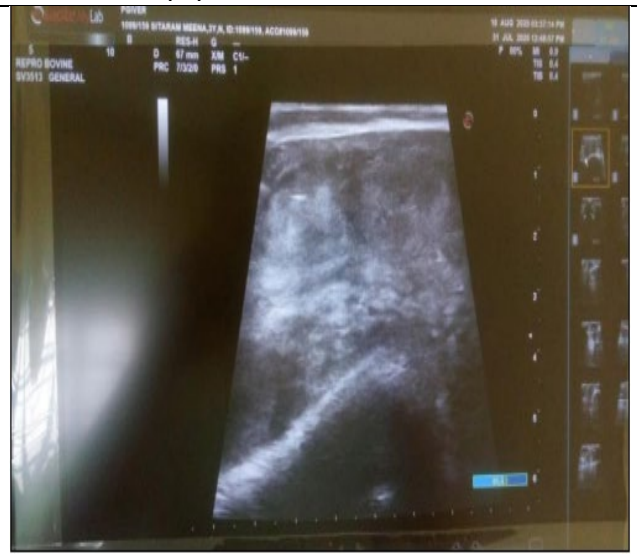


Adrenal virilism:

Mucometra/Hydrometra



- Often noticed in long standing cases
- Hyperplasia of the mucosa
- Cystic dilatation of the endometrial glands
- Marked cystic dilatation develops a typical Swiss cheese appearance
- Uterus accumulated with 100-1000 cc of watery mucus
- Affects single horn/ portion of the horn
- If infection occurs, may lead to pyometra



Luteal cyst

- Prolonged Anoestrus
- Erratic changes in milk production
- Rough dry hair coat
- Nervous tension
- Disturbed feeding and rumination
- Progressive emaciation

Diagnosis

History and clinical signs

Follicular cyst	Luteal cyst
<ul style="list-style-type: none"> ➤ Relaxation of vulva and perineum ➤ Nymphomania ➤ Irregular estrous cycle ➤ Sterility hump ➤ Tougher, more tenacious and opaque vaginal mucous with a mucopurulent appearance ➤ High milk yield ➤ Adrenal virilism 	<ul style="list-style-type: none"> ➤ Prolonged Anoestrus ➤ Erratic changes in milk production ➤ Rough dry hair coat ➤ Nervous tension ➤ Disturbed feeding and rumination ➤ Progressive emaciation

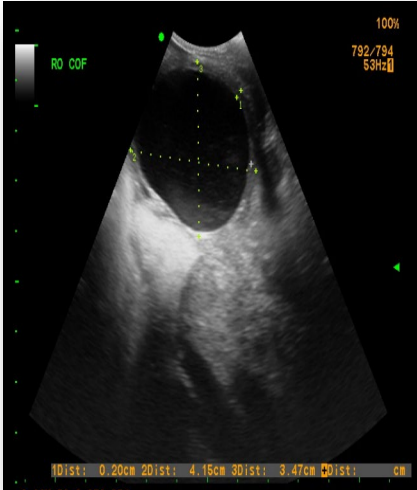
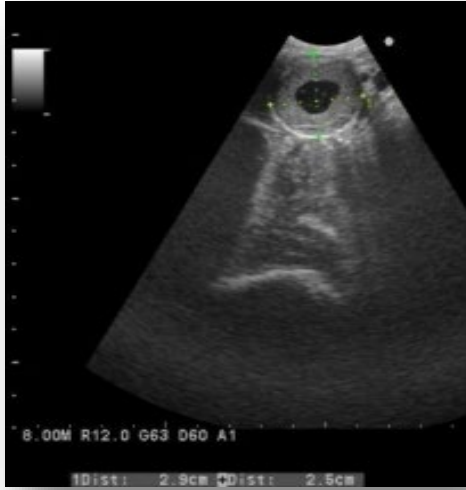
Rectal examination

Follicular cyst	Luteal cyst
<ul style="list-style-type: none"> • External os of the cervix- large and highly relaxed • Turgid uterus with doughy consistency • Single or multiple (common) • Enlarged, thin walled fluid filled 	<ul style="list-style-type: none"> • Single • Enlarged ovary • Thick-walled structure • Flaccid uterine horns • Closed cervix



follicular structures • Voluminous cervical discharge • Chronic cases- accumulation of mucus with debris	
--	--

Ultra-sonographic examination

Follicular cyst	Luteal cyst
<ul style="list-style-type: none"> ✓ Anechoic fluid filled cavity ✓ Diameter > 2.5 cm ✓ Wall Thickness-< 3mm ✓ Swiss cheese appearance 	<ul style="list-style-type: none"> ✓ Single ✓ Enlarged ovary ✓ Thick-walled structure ✓ Flaccid uterine horns ✓ Closed cervix
	
<p>Image 1: B-mode, Follicular Cyst</p>	<p>Image 2: B-mode, Luteal Cyst</p>

Progesterone concentration

- a. Follicular cyst: Serum P4: <1 ng/ml; Serum E2: 13.3 pg/ml
- b. Luteal cyst: Serum P4: ≥1 ng/ml; Serum E2: <10 pg/ml

Treatment

Manual rupture

- Earliest treatment
- Single/ repeated manual rupture (6-10 days' interval)
- Thick walled – Not possible
- Disadvantages – Haemorrhage, Ovario-bursal adhesions, sterility

Potassium Iodide 10-15 gm for 5 days, Iodine Inj. (Ifer-H 2 ml SC).

Specific treatment for Luteal Cyst

PGF2α



- Natural - Dinoprost Tromethamine – Lutalyse – 25 mg
- Synthetic – Cloprostenol sodium – Pragma – 500-750 mcg

GnRH + PGF2 α

- Day 0 – GnRH (Receptal – Busarelin acetate 20 mcg) or LH (Chorulon -HCG – 3000 IU)
- Day 7/10 - Dinoprost Tromethamine / Cloprostenol sodium

Specific treatment for Follicular Cyst

GnRH / HCG

- Day 0 – GnRH (Receptal – Busarelin acetate 20 mcg) or LH (Chorulon -HCG – 3000 IU)
- Day 7/10 - Dinoprost Tromethamine (25 mg) / Cloprostenol sodium (500- 750 mcg)

Prevention and control

- Culling and Selective Breeding
- Rationale use of Hormones
- Implementation of synchronisation technique during post-patum period
- Reducing the length of postpartum negative energy balance period

Balanced feeding

- Adequate concentrate feeding
- Green fodder
 - Maximizing dry matter intake and reducing protein content in diet
 - Minimizing the occurrence of metabolic diseases.

References

- Jeengar, K., Chaudhary, V., Kumar, A., Raiya, S., Gaur, M., & Purohit, G. N. (2018). Ovarian cysts in dairy cows: old and new concepts for definition, diagnosis and therapy. *Animal Reproduction (AR)*, 11(2), 63-73.
- Nanda, A. S., Ward, W. R., Williams, P. C., & Dobson, H. (1988). Retrospective analysis of the efficacy of different hormone treatments of cystic ovarian disease in cattle. *The Veterinary Record*, 122(7), 155-158.
- Noseir, W. M. B., & Sosa, G. A. M. (2015). Treatment of ovarian cysts in buffaloes with emphasis to echotexture analysis. *J. Dairy Vet. Anim. Res*, 2(2), 1-2.
- Singh, B., Rawal, C. V. S., Singh, K. P., Singh, J. P., Singh, S. V., & Singh, H. N. (2008). A case of follicular cyst in a buffalo. *Intas Polivet*, 9(2), 187-188.
- Sarma, P. K., & Talukder, G. (2010). Management of cystic ovarian condition with synthetic PGF2 α —a case report. *Intas Polivet*, 11(1), 15-15.
- Gad, M., Elbaz, H. T., El-Razek, A., Zaghloul, A., & Genedy, T. (2022). Different Therapeutic Approaches for Treatment of Cystic Ovarian Disease (COD) and its Effect on Conception Rate in Holstein Dairy Cows. *Journal of Current Veterinary Research*, 4(1), 175-181.

